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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,711	07/22/2003	Patrick Noll	API-1029US	8121

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EXAMINER

TESKIN, FRED M

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,711

Applicant(s)

NOLL, PATRICK

Examiner

Fred M. Teskin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on July 25, 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8, 10 and 11 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 9 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Applicant's election of the species found on page 5, lines 5-11 of the specification, in the reply filed on July 15, 2005, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

No prior art having been found that anticipates or renders obvious the elected species, the search has been expanded to the extent of determining patentability of the generic claims. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn.

In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

The disclosure is objected to because of the following informalities: at page 15, line 2, the term "Derivative (sic., Derivative)" is misspelled.

Appropriate correction is required.

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Claim 11 is objected to because of the following informalities: the claim fails to conclude with a period. Appropriate correction is required.

Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 (and claims dependent thereon) recites the limitation "the variables" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "optimizing" and "optimized" in claims 10 and 11, respectively, are relative terms which render the claims indefinite. The terms are relative in that what constitutes an "optimized" reactor configuration or element will vary as a function of parameters not defined in claims, e.g., type/grade of polyethylene being produced, target production rates and material cost, and the specification does not provide a standard for ascertaining the requisite configurations/elements. Thus, at page 15, it is stated that the process of the present invention can be used to optimize and control a loop reactor to produce polyethylene with desirable properties; however, the expression "desirable properties" is itself subjective in the absence of any indication of property profiles considered "desirable" for purposes of the present invention. Accordingly, one

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of ordinary skill would not be reasonably apprised of the scope of the invention - i.e., the scope of reactor configurations and designs that would infringe claims 10 and 11.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3636326 to Smith et al.

Claim 1 is drawn to a process for producing polyethylene using a slurry loop reactor comprising using a mathematical model to predict a plurality of process control parameters based on the desired product properties and reactor characteristics and controlling the process using the predicted process control parameters.

Smith et al describe the control of a polymerization reaction through use of a production control computer whose output signal regulates introduction of fresh catalyst into the reactor. Using input signals representative of variables of the reaction system, an overall heat balance is made, from which the polymer formation rate is calculated

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(col. 2, ll. 20+). The output signal is used to effectively "control" the process by regulating introduction of fresh catalyst into the reactor based on a comparison of the computed production rate with the desired production rate for a given system (col. 4, ll. 20-27). Application of this control system to polyethylene production in a loop reactor, into which catalyst slurry is incrementally introduced, is depicted (Figure 1) and described (col. 1, lines 41+; see especially ll. 58-60 and 64-66).

In order to compute/calculate polymer formation rate, the computer of Smith et al must necessarily be programmed to execute a "mathematical model" as per claim 1. Further, being a calculated value, the polymer formation rate is considered a "predicted" process parameter, which is compared to a "desired" reactor characteristic, namely, the desired production rate for a given system. A uniform production rate is said to be desirable to produce specification products at minimum operating costs (col. 1, ll. 3-5).

Thus, Smith et al is seen to describe a process controller that predicts (by mathematically calculating) process control parameters (polymer production/formation rates) based on desired product properties and reactor characteristics (in-spec products and target production rates) and uses the predicted parameters (via comparison of calculated/desired production rates) to control the production of polyethylene in a slurry loop reactor.

As such, Smith et al is deemed to fully meet claim 1.

Similarly, claim 2 is readable on variables specifically taught by Smith et al as providing inputs to their production rate computer; e.g., volumetric flow rate of ethylene and comonomer in conduit 11 leading to the loop reactor, density of polymer slurry

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collected in settling leg **26**, from which the polymer concentration is calculated, and rate of polymer withdrawal from the reactor. (See column 2, lines 25-26, 31-36 and 59-63.) It is stated that from these input signals, an overall heat balance is made and the polymer formation rate can be calculated (*Id.*, ll. 73-75). Thus, Smith et al teach incorporating the above-noted variables into a controller (computer of a control system) in order to mathematically compute a process control parameter (polymer production rate) within the reactor, in compliance with claims 2 and 6.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al, in view of US 6303825 to Gerlich et al.

Smith et al is applied as in the preceding rejection. Smith et al teach that the computer of Fig. 2 can be a conventional digital computer programmed to perform the calculations illustrated in the drawing (col. 5, ll. 10-15), but do not mention an algorithm-programmed controller as recited in claim 8.

However, as acknowledged in the background section of applicant's specification (p. 2, ll. 4-8), the utility of a microprocessor to automate start up and running of a loop reactor is well known in the art as taught by Gerlich et al. In this context, Gerlich et al explicitly suggest algorithms that automatically control the loop reactor system (col. 5, ll. 43-46). More broadly, the patentees' method is said to relate to loop reactors in which an exothermic reaction is to occur (col. 2, ll. 14+).

Inasmuch as ethylene polymerization is a well-known and common exothermic reaction, those skilled in the art would have been led to look to Gerlich et al for guidance

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when programming the digital computer of the Smith et al control system. To this end, one of ordinary skill would have been well motivated to program the digital computer of Smith et al with an algorithm as taught by Gerlich et al. The expectation of successfully obtaining an automated control system for controlling polyethylene production in a loop reactor would have provided the requisite motivation to so modify Smith et al and arrive the subject matter of claim 8.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Grayson et al is pertinent to control of a continuous process using neural network technology. Application of a neural network model to controlling polyethylene production in a loop reactor is not taught nor fairly suggested.

Ayres et al and Braganca et al are pertinent to, respectively, a loop reactor settling leg system and on-line control of certain process variable in the controlled production of HDPE and LLDPE in single or combined gas phase reactors.

Claims 3, 4, 10 and 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 5, 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter: Claims 3 and 4 require the use of a combination of specific variables to prepare the mathematical model used in the claimed process. Claims 5, 7 and 9 stipulate use of a mathematical model which has been incorporated into a spreadsheet or one which has been incorporated into a neural network model based controller. Claims 10 and 11 call for using the mathematical model of claim 1 to design the polyethylene loop reactor.

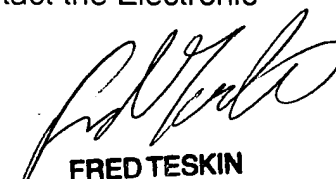
Examiner has not found this claimed subject matter in the prior art within the meaning of 35 U.S.C. 102 or 103.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/08-31-05


FRED TESKIN
PRIMARY EXAMINER
2-22-05